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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRAN, DIEM T

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,959	Applicant(s) BECKMANN ET AL.	
	Examiner Diem Tran	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-35 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-28,30,32-35 is/are rejected.
- 7) ☒ Claim(s) 29 and 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/25/06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

The preliminary amendment filed on 4/25/06 has been acknowledged. In the amendment, claims 1-15 have been canceled and claims 16-35 have been added. Overall, claims 16-35 are pending in this application.

Claim Objections

Claims 34, 35 are objected to because of the following informalities:

-In claims 34, 35, "the switching device" lacks antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16, 26-28, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cullen et al. (US Patent 5,778,666) in view of Binder et al. (US Patent 6,766,642).

Regarding claims 16, 28, 33, Cullen discloses an internal combustion engine having an exhaust-gas purification system, comprising:

a nitrogen oxide storage catalytic converter (32); a control unit wherein the control unit is programmed to supply the nitrogen oxide storage catalytic converter in a first operating mode with exhaust gas from the internal combustion engine containing an excess of oxidizing

constituents, in a second operating mode with exhaust gas containing an excess of reducing constituents, and in a third operating mode, established after the first operating mode and before the second operating mode, with an exhaust gas which has a lower content of oxidizing constituents than the first operating mode and a lower content of reducing constituents than the second operating mode (see Figures 1, 2, col. 1, lines 52-55); however, fails to disclose a SCR catalyst downstream of the NOx storage device. Binder teaches that a SCR catalyst (8) is located downstream of a NOx storage device (7) (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the teaching of Binder in the Cullen system, since the use thereof would have further reduced harmful NOx emissions in the exhaust gas.

Regarding claim 26, Binder further teaches that an oxidation catalyst (5) is connected upstream of the SCR catalytic converter (8) (see Figure 1).

Regarding claim 27, Binder further teaches that a particulate filter (6) connected upstream of the SCR catalytic converter (8) (see Figure 1).

Claims 17-25, 30, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cullen et al. (US Patent 5,778,666) in view of Binder et al. (US Patent 6,766,642) as applied to claims 16, 28 above, and further in view of Kupe et al. (US Patent 6,832,473).

Regarding claims 17-20, 22, 30, the modified Cullen system discloses all the claimed limitations as discussed in claims 16, 28 above, however, fails to disclose that the nitrogen oxide storage catalytic converter includes a first NOx storage catalytic converter element and a second

NOx storage catalytic converter element is connected in parallel with the first nitrogen oxide storage catalytic converter element. Kupe teaches that a first NOx storage catalytic converter element and a second NOx storage catalytic converter element are connected in parallel with the first nitrogen oxide storage catalytic converter element (see Figure 5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the teaching of Kupe in the modified Cullen system, since the use thereof would have maintained the drivability and engine performance during NOx regeneration.

Regarding claims 21, 23, the modified Cullen system discloses all the claimed limitations as discussed in claim 16 above, however, fails to disclose that a gas delivery device is operable to deliver a gas stream to the nitrogen oxide storage catalytic converter when the nitrogen oxide storage catalytic converter is operating in rich operating mode. Kupe teaches that a gas delivery device is operable to deliver a gas stream to a NOx storage catalytic converter in rich operating mode to regenerate the NOx storage catalyst (see Figure 5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the teaching of Kupe in the modified Cullen system, since the use thereof would have provided an effective means to supply reducing agent into the exhaust gas for regenerating the NOx storage catalyst.

Regarding claims 24, 25, 32, Kupe further discloses that the gas delivery device is fuel reformer (see Figure 2).

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cullen et al. (US Patent 5,778,666) in view of Binder et al. (US Patent 6,766,642) and Kupe et al. as applied to claim 32 above, and further in view of Laroo et al. (US Patent 6,779,339).

The modified Cullen system discloses all the claimed limitations as discussed in claim 32 above, however, fails to disclose that a temperature of the NO_x storage catalytic converter element is controlled by adjusting the switching device. Laroo teaches that a temperature of NO_x storage catalytic converter element is controlled by adjusting a switching device (see col. 16, lines 45-46, 55-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Laroo in the modified Cullen system, since the use thereof would have maintained the NO_x storage catalyst at an effective temperature for better reducing harmful NO_x emissions in the exhaust gas.

Claim 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cullen et al. (US Patent 5,778,666) in view of Binder et al. (US Patent 6,766,642) as applied to claim 33 above, and further in view of Laroo et al. (US Patent 6,779,339).

The modified Cullen system discloses all the claimed limitations as discussed in claim 33 above, however, fails to disclose that a temperature of the nitrogen oxide storage catalytic converter element is controlled by adjusting the switching device. Laroo teaches that a temperature of the nitrogen oxide storage catalytic converter element is controlled by adjusting the switching device (see col. 16, lines 45-46, 55-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Laroo in the modified Cullen system, since the use thereof would have maintained the NO_x storage catalyst at an effective temperature for better reducing harmful NO_x emissions in the exhaust gas.

Allowable Subject Matter

Claims 29, 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Allowable Subject Matter

Claims 29, 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (571) 272-4866. The examiner can normally be reached on Monday -Friday from 8:00 a.m.- 5:30p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 800-786-9199 (toll-free).

/Diem Tran/
Patent Examiner

/Thomas E. Denion/
Supervisory Patent Examiner, Art Unit 3748